

APHIDS OF SUNFLOWER: DISTRIBUTION AND HOSTS IN
NORTH AMERICA (HOMOPTERA: APHIDIDAE)¹

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Abstract.—Distribution and host data are given for aphids on 15 species of *Helianthus* collected in the United States in 1976 and 1977. Aphids of the genus *Dactynotus* were found primarily on eastern perennial species of *Helianthus*. *Aphis helianthi* Monell and *Masonaphis masoni* (Knowlton) were found mostly on western annual species of *Helianthus*. A summary of previous records for aphids on *Helianthus* is also given.

Little is known about the bionomics or effects of aphids on sunflower. Rogers et al. (1972) reported that *Aphis helianthi* Monell on *Helianthus annuus* L. served as a good alternate host for parasitoids released to control the greenbug, *Schizaphis graminum* (Rondani), on sorghum. Most reports of aphids on sunflower have been included in regional surveys (Williams, 1910; Hottes and Frison, 1931; McGillivray, 1958; Leonard, 1959; Palmer, 1952; Leonard and Tissot, 1965; Leonard, 1968; and Olive, 1963) and taxonomic studies (Olive, 1965). Some of the aphids that are known from sunflower are well-known vectors of viruses (Kennedy et al., 1962).

Sunflower has become an important oilseed crop in the United States. Because of the importance of aphids as pests on other crops (Gibson and Plumb, 1977), this study was designed to determine the species and abundance of aphids on native *Helianthus* species.

Materials and Methods

Two of us (CER and TET) drove about 24,000 km in the southern half of the United States in 1976 and 1977 and collected native species of *Helianthus* and associated aphids. We paid particular attention to the effect of the aphids on their host plants. Aphids were collected in 70% ethyl alcohol for subsequent sorting and identification. Plants were identified *in situ* according to Heiser (1969). Specimen mounts of plants were also prepared and later confirmed by Dr. C. B. Heiser, Jr. MBS identified the aphids, and voucher specimens have been placed in the U.S. National Museum Collection at Beltsville, Maryland.

Results and Discussion

Some species of aphids reported from sunflower normally use other genera as primary hosts (Table 1). For example, *Aphis gossypii* Glover

Table 1.—Aphids known from *Helianthus* species in North America.

Aphid species	<i>Helianthus</i> host ^a	Location	Authority
<i>Aphis armoraciae</i> Cowen	<i>pumilis</i> Nuttall (P)	Rocky Mtns.	Palmer (1952)
<i>A. debilicomis</i> (Gillette & Palmer)	<i>annuus</i> (A)	Rocky Mtns.	Palmer (1952)
	<i>grosseserratus</i> Martens (P)	MO	Leonard (1963)
	<i>tuberosus</i> L. (P)	Rocky Mtns.; MO	Palmer (1952) Leonard (1959)
<i>A. gossypii</i> Glover	cultivar (A)	TX	Leonard & Tissot (1965)
	species (?)	TX	Leonard & Tissot (1965)
<i>A. helianthi</i> Monell	<i>annuus</i>	Rocky Mtns.; KS	Palmer (1952); Walker (1936)
	<i>petiolaris</i> Nuttall (A)	Rocky Mtns.	Palmer (1952)
	<i>tuberosus</i>	MO	Leonard (1963)
	species (?)	KS; MO; NE; OK; Rocky Mtns.; TX	Walker (1936); Leonard (1963); Williams (1910); Rogers et al. (1972); Palmer (1952); Leonard and Tissot (1965)
<i>Bipersona ochrocentri</i> (Cockerell)	<i>annuus</i>	MO	Leonard (1962)
<i>Dactynotus ambrosiae</i> (Thomas)	<i>annuus</i>	Rocky Mtns.	Palmer (1952)
	<i>grosseserratus</i>	MO	Leonard (1963)
	species (?)	TX; (?)	Leonard & Tissot (1965); Olive (1965)
	<i>tuberosus</i>	MO	Leonard (1963)
<i>D. helianthicola</i> Olive	<i>atrorubens</i> L. (P)	NC	Olive (1963)
	<i>microcephalus</i> Torrey & Gray (P)	NC	Olive (1963)
	<i>strumosus</i> L. (P)	NC	Olive (1963)
	<i>tuberosus</i> (P)	NC	Olive (1963)
	species (?)	TX	Leonard & Tissot (1965)
<i>D. illini</i> (Hottes & Frison)	species (?)	(?)	Olive (1965)

^a A = annual; P = perennial

Table 1.—Continued.

Aphid species	<i>Helianthus</i> host ^a	Location	Authority
<i>D. obscuricaudatus</i> Olive	<i>strumosus</i>	PA	Olive (1965)
<i>D. parvtotubercultus</i> Olive	<i>atrorubens</i>	NC	Olive (1965)
<i>D. pseudambrosiae</i> Olive	<i>microcephalus</i>	NC	Olive (1965)
<i>D. rudbeckiae</i> (Fitch)	species (?)	TX	Leonard & Tissot (1965)
<i>D. ruralis</i> (Hottes & Frison)	species (?)	?	Olive (1965)
<i>Dactynotus</i> sp.	<i>grosseserratus</i>	MO	Leonard (1959)
	<i>tuberosus</i>	MO	Leonard (1963)
<i>Macrosiphum euphorbiae</i> (Thomas)	<i>annuus</i>	Rocky Mtns.	Palmer (1952)
	species (?)	Rocky Mtns.	Palmer (1952)
<i>Macrosiphum</i> sp.	<i>tuberosus</i>	MO	Leonard (1959)
<i>Masonaphis masoni</i> (Knowlton)	<i>annuus</i>	(?)	MacGillivray (1958)
	species (?)	(?)	MacGillivray (1958)
	species (?)	CO	Palmer (1952)
<i>Prociphilus erigeronensis</i> (Thomas)	<i>annuus</i>	Rocky Mtns.	Palmer (1952)
	species (?)	CO	Palmer (1952)

(cotton aphid) and *Macrosiphum euphorbia* (Thomas) (potato aphid) are common pests on the crops indicated by their common names. Also, the species names for *Aphis amoraciae* Cowen, *Dactynotus ambrosiae* (Thomas), *D. rudbeckiae* (Fitch), and *Prociphilus erigeronensis* (Thomas) implicate genera other than *Helianthus* as the primary host plants for these aphids. The published records suggest that *Aphis* species commonly colonize annual species of *Helianthus*, whereas *Dactynotus* species colonize perennial species of *Helianthus*.

We collected 47 species of *Helianthus*, 15 of which harbored aphids (Table 2). Aphids were also collected from 'Hybrid 896' and from a cultivar of unknown parentage. Our data verified that *Dactynotus* species colonize primarily perennial *Helianthus* species and that other genera occur mostly on annual sunflowers. We have shown that several species of perennial *Helianthus* are resistant to *Masonaphis masoni* (Knowlton), a species that is common on *annuus* types and cultivated sunflower (Rogers and Thompson, 1978). Also, *Dactynotus helianthicola* Olive failed to survive in the laboratory when transferred from the perennial *H. occiden-*

Table 2.—Aphids collected from *Helianthus* species in the United States during 1976 and 1977.

Aphid species	<i>Helianthus</i> host ^a	Location
<i>Aphis deblicornis</i> (Gillette & Palmer)	<i>nuttallii</i> Torrey & Gray (P)	CO
<i>A. helianthi</i> Monell	<i>annuus</i> (A)	AR; CA; CO; KS; NM; NV; TX; UT
	<i>neglectus</i> Heiser (A)	NM
	<i>petiolaris</i> (A)	CO
	Hybrid 896 (A)	TX
<i>Dactynotus ambrosiae</i> (Thomas)	<i>petiolaris</i>	CO
<i>D. helianthicola</i> Olive	<i>heterophyllus</i> Nuttall (P)	MS
	<i>tuberosus</i> (P)	OK; SC
	<i>microcephalus</i> (P)	AL
	<i>occidentalis</i> (P)	MO
	<i>longifolius</i> Pursh (P)	AL
	<i>atrorubens</i> (P)	NC
	<i>silphioides</i> Nuttall (P)	OK
<i>Dactynotus</i> sp.	<i>argophyllus</i> Torrey & Gray (A)	TX
	<i>grosseserratus</i> (P)	TX
	<i>maximiliani</i> Schrader (P)	TX
	<i>petiolaris</i>	NM
	<i>tuberosus</i>	TX
<i>Macrosiphum euphorbiae</i> (Thomas)	<i>petiolaris</i>	CO
	cultivar	CA
	Hybrid 896	TX
<i>Masonaphis masoni</i> (Knowlton)	<i>paradoxus</i> Heiser (A)	TX
	Hybrid 896	TX
	<i>nuttallii</i> (P)	CO
<i>Myzus persicae</i> (Sulzer)	cultivar	CA
	Hybrid 896	TX
<i>Rhopalosiphum</i> sp.	<i>annuus</i>	NM
	Hybrid 896	TX

^a A = annual; P = perennial

talis Riddell to Hybrid 896. These narrow host preferences among sunflower aphids become very important in the development of aphid-resistant sunflower hybrids.

The host and distribution data shown in Table 2 (but not in Table 1) probably represent new records. For the most part, *Dactynotus* species

were found primarily on eastern perennial species of *Helianthus*, and *A. helianthi* mostly on western annual species of *Helianthus*. *Dactynotus* species feed mainly on the upper stems and leaf petioles of sunflower. *Aphis helianthi* and *M. masoni* feed mainly on lower leaf surfaces and on the underside of receptacles. *Macrosiphum euphorbia* feeds on the terminal of plants and on ray flowers around the receptacle. One alate *Hysteronuera setariae* (Thomas) adult was found on *H. microcephallus* Torrey and Gray in North Carolina, probably as a result of an accidental landing.

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Footnote

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